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400°

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baked finish on a wooden frame and metal body

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Your company certainly does pay enough for body finish!

Whether it is one coat or 15—by forced drying or so-called baking at 170°—the cost of such work today is 'way above steel-hard 400° baked finish when done by the Oxford Method. We offer no criticism. Your company probably has always used the best available method.

Especially in this past year, production has been at a premium. The 8 to 24 days required for normal drying had to be cut. Who was satisfied with the result—your company, your dealer, your owners? 1923 will again bring the problem of fast production and we feel you will be interested in knowing that our method requires but 90 minutes per coat.

Our 400° baking method is not the first one attempted on metal bodies with wood frames but it is the first one to succeed. For two years it has been standard on one of the biggest production jobs.

Yet, not until now have we been at liberty to offer it to other makers.

U. S. PATENT OFFICE
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The Oxford Method

For the first time a method has been perfected for enameling metal panel bodies at high temperatures (400°) without shrinkage, splitting of glue joints or loss of resiliency.

In cost the process is considerably less than any other method including the cheapest of paint or semi-bake work.

Unprecedented speed combined with high lustre of great durability are the outstanding features of the Oxford method.

On metal panel bodies less than 7½ hours are required from the first coat to the complete drying of the 5th or finishing coat.

Speed has not been gained at a sacrifice of quality.

Oxford Method bodies that have been in constant use in all weathers for over two years still show no signs of checking, lifting or dimming of lustre—the surface is almost as hard as the steel.

Three to five coats of Oxford enamel equal twelve to fifteen coats of any other enamel or paint hitherto used.

One pumice rub or water sanding instead of eight or ten is sufficient if ordinary care has been exercised in the sheet metal room.

All Oxford enameling is done with the flow gun, thus avoiding the safety precautions such as respirators, force draft ventilators and fans necessary with the spray gun.

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Steps In The Oxford Method

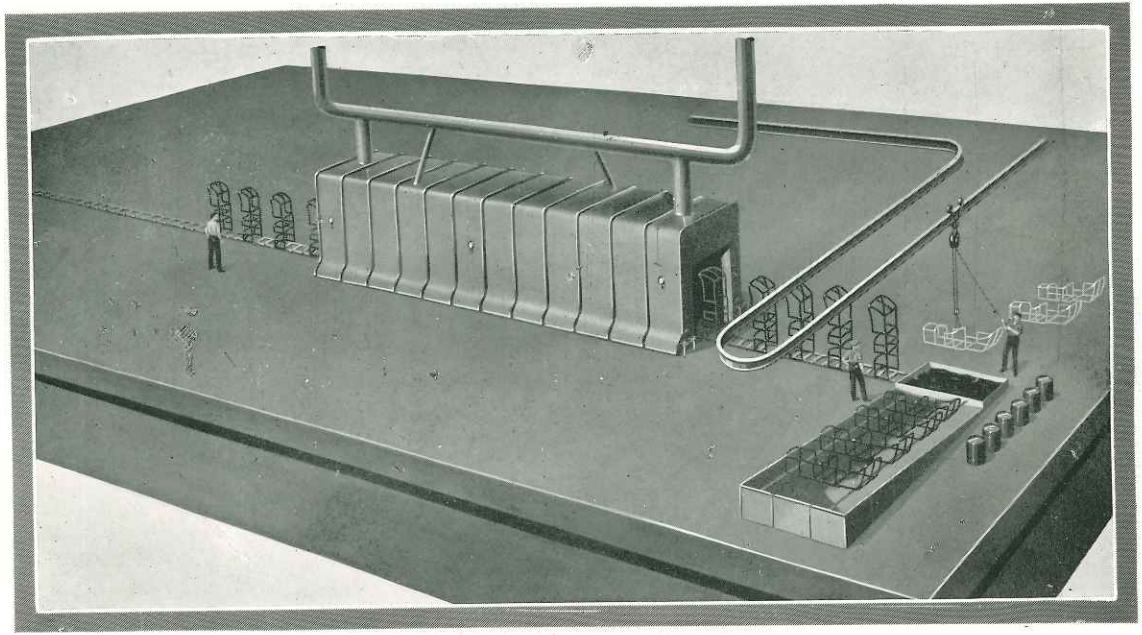
The wood frame is first dipped in a tank of Oxford wood frame cement.

This cement when baked forms a hard shell around the wood, retaining the moisture during the baking process and preventing the wood from charring at the high temperatures used for baking the steel body panels.

One-half gallon of wood frame cement is the amount used per body.

The body panels are put in place and the first coat of Oxford enamel applied on the bare metal with the flow gun.

The body is now baked for thirty minutes at a temperature of 250° rising to 400° and for a further sixty minutes at 400°—or 90 minutes in all.



This model shows the dipping of the wood frame in the Oxford wood frame cement. In the oven where it is baked at 250°, a hard protective shell is formed enabling the frame to undergo body baking temperatures of 400° without charring, loss of moisture or resiliency.

Two other similar coats and two bakings of 90 minutes each at from 250° to 400° see the body ready for the one and only pumice rub or water sanding.

After leaving the rubbing deck the body is given the first coat of Oxford finishing enamel with the flow gun and another 90 minutes baking from 250° to 400°.

A second and final coat of Oxford finishing enamel is applied and the body again baked at 250° to 400° for a further 90 minutes.

This completes the whole method which has taken only 7½ hours from start to finish. Five quarts of Oxford enamel have been used.

Compare the amount of time, labor and material involved with any other method of painting or enameling in use.

Some Interesting Comparisons
Time Required

Painting without artificial drying takes on an average 15-24 days.

Hastened Dry Air or Semi-bake methods take from 8-10 days.

The Oxford Method takes 7½ hours for metal panel bodies.

Suggested Specifi

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April,

PART	How Coated	No. Coats	No. Bakes	T
Chassis Frame (presumed steel)	Dip	2	2	
Fenders—each (steel)	Dip	3	3	
Hoods—(steel)	Dip	3	3	
Sundry Small Parts. (sheet steel)	Dip	2	2	
Body	Treat Frame before Paneling—Oxf			
Body—after paneling and after cleaning	Flow Gun	3	3	3(1
Axles and Gear (less wheels)	Spray	1	Warm Room	
Axles and Gear (less wheels)	Spray	1	Warm Room	
Wheels (color to make desired contrast)	Spray	3	Warm Room	

cations for Finish

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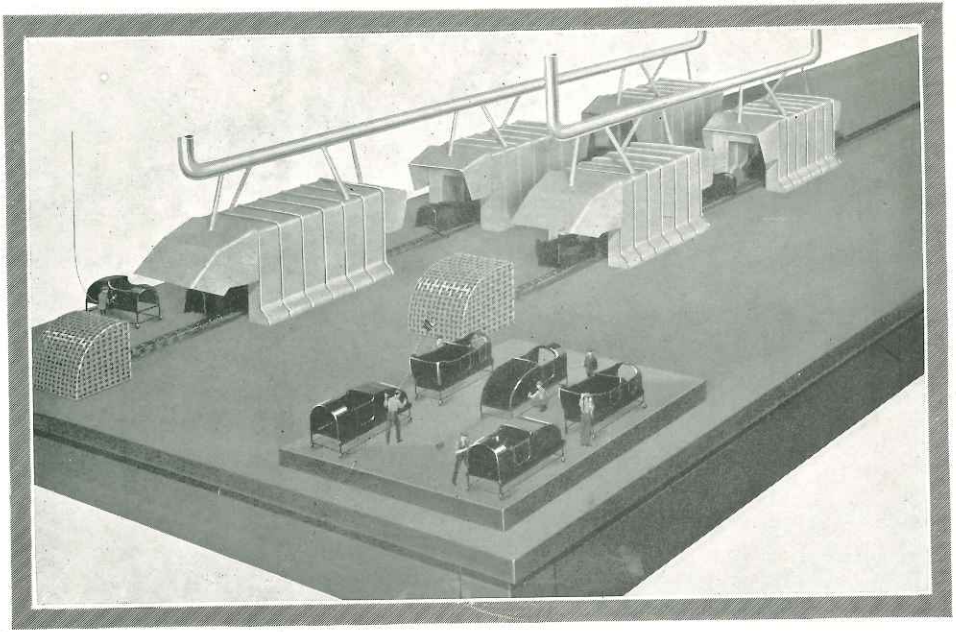
der Car

1922

emp. and Time	MATERIAL	HANDLE	Approximate Cost
400° 1 Hour	Oxford High Bake	Conveyor	Varies per condition of metal. Suggest .25
400° 1 Hour	Oxford High Bake	Conveyor	Varies per condition of metal. Suggest .40
400° 1 Hour	Oxford High Bake (If any solder use Oxford Body Black)	Conveyor	.55
400° 1 Hour	Oxford High Bake	Conveyor	Various
ord Cement			$1.00
00° to 400° 1½ Hours	Oxford Body Black	Conveyor	$4.00
Vary	Oxford Air Dry Primer—Antirust	Conveyor	$1.00
Vary	Oxford Chassis Black—Air Dry	Conveyor	$1.00
Vary	Any suitable material made by OXFORD		



When the metal panels are in place, the body is given three-five coats of Oxford enamel and each coat is baked 30 minutes at 250° gradually rising to 400°. Then at 400° for 60 minutes—90 minutes in all. Only one pumice rub or water sanding is required.

Number of Coats

Painting and Semi-bake methods require 10-15 coats—two of heavy primer, one of putty glaze, four of "stuff," one of sealer, one of coach color, two of color varnish, one of clear rubbing varnish and one of finishing varnish.

The Oxford Method uses only one coat of wood frame cement and five coats of Oxford enamel. Three coats are often considered sufficient.

Rubbing

Painting and Semi-bake methods entail 5-8 rubs.

Each body on the rubbing deck employs two men for four hours at a cost of $5.00.

Two men can rub only three bodies a day.

The Oxford Method takes but one rub.

Quantity of Material

Painting and Semi-bake methods consume from 2½ to 4 gallons of primer, paint and varnishes at from $1.90 to $7.50 per gallon per body—from $6.00 to $12.00 per body.

The Oxford Method uses one quart per coat per body, three to five quarts at $2.00 per gallon—from $1.50 to $2.50 per body.

Pumice and sandpaper have not been included in this estimate.

Quality

Paint work without artificial drying necessitates extreme care in the application of the coats and the subsequent rubbing. Unless the under coats are well applied and thoroughly dried they lack the desired hardness and elasticity and the upper coats will lift and check.

Semi-baking processes are seldom satisfactory. They consist in putting the bodies through ovens at 170° to 180°, which temperatures fall just short of splitting the glue joints and causing shrinkage, but also fall short of proper baking.

The wearing qualities of these enamels is usually poor and there is much dimming of lustre, checking and lifting.

The Oxford Method which entails temperature of 400° thoroughly bakes the undercoats and gives steel-hard enameling at every stage and throughout the substance.

Automobiles in use for two years and over have so far shown no signs of checking or lifting. The lustre is almost as bright as when they left the factory.

Saving In Investment and Floor Space

Assuming that the average time for painting without artificial drying is 24 days, and that the average value of a body is $300, also assuming that the plant is turning out 50 bodies per day, then the space required for painting and drying would be that for 1,200 bodies in which would be tied up the sum of $360,000, the interest on which for 24 days at 6% is $1,420.

But the Oxford Method requires only 7½ hours or less than one day.

The interest on $360,000 for one day is only $59—a money saving of $1,361.

Besides this money saving, there is an extraordinary economy in floor space, drying rooms, equipment, etc.

Summary of Advantages

(1) Steel-hard bake.

(2) High lustre and finish which outlast the car.

(3) Costs one-half to two-thirds less than any other method.

(4) Takes one-tenth of the time.

(5) Saves in material, labor, floor space, investment and overhead.

(6) High-bakes wood frame without charring, loss of moisture, resiliency or the development of squeaks.

(7) Facilitates resale of used cars—no refinishing required.

Our Service

All inquiries will receive detailed and cordial response. Sample sections of Oxford enameled wood frame or metal body will be sent if desired.

Complete oven installations are open to your inspection and the whole process can be shown to you on a paying production basis.

Our representatives, who are not salesmen but practical consulting engineers, are at your disposal and will give expert advice, without obligation, on the installation of all necessary equipment.

We shall be glad to Oxfordize your sample bodies on request.

OXFORD

VARNISH CORPORATION

DETROIT — TOLEDO

DETROIT, MICH.

U. S. PATENT OFFICE
AUG 29 1923
DIVISION X

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39th Street, York, N. Y.
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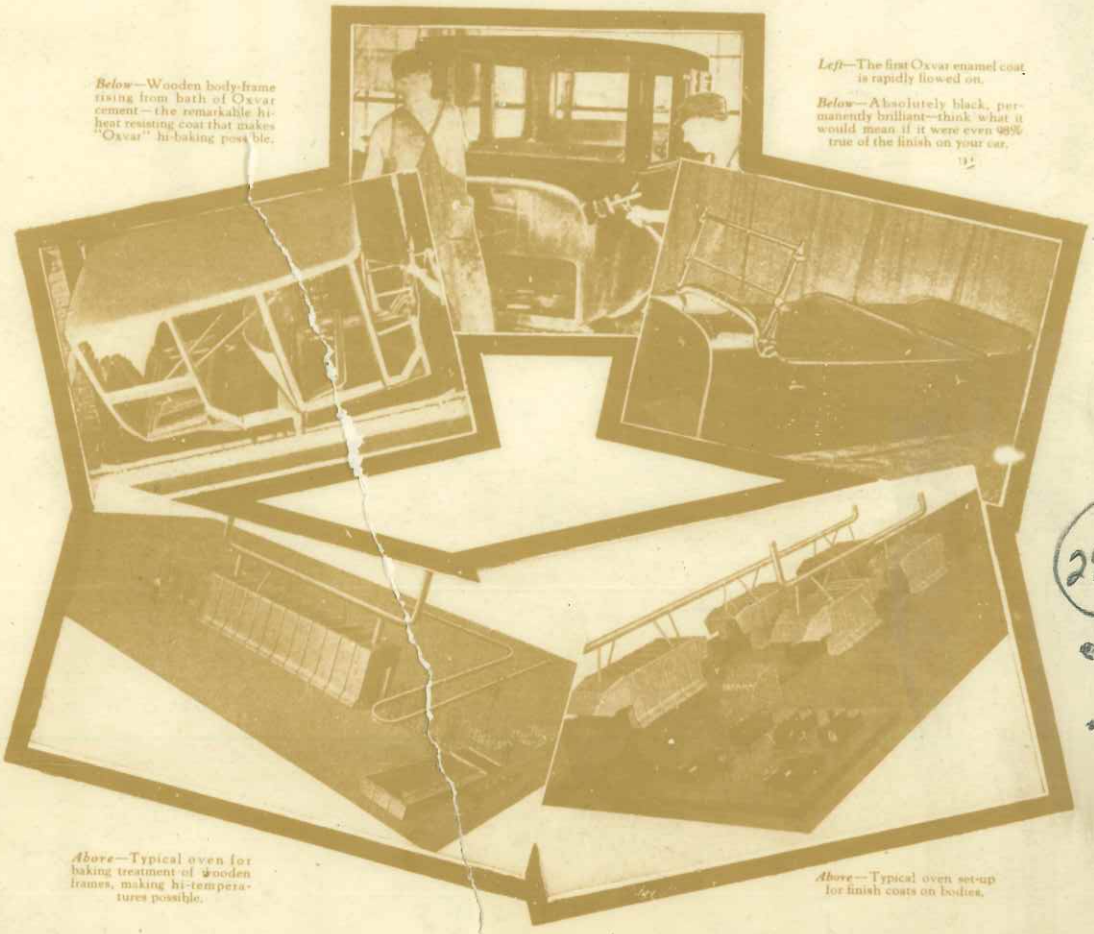
Automotive Industries
May 17, 1923

A 400° Baking Revolutionizing

1/3 the Cost—1/10 the Time, and a Result Far Superior to Ordinary Practice



Below—Wooden body-frame rising from bath of Oxvar cement—the remarkable hi-heat resisting coat that makes "Oxvar" hi-baking possible.

Left—The first Oxvar enamel coat is rapidly flowed on.

Below—Absolutely black, permanently brilliant—think what it would mean if it were even 98% true of the finish on your car.

Above—Typical oven for baking treatment of wooden frames, making hi-temperatures possible.

Above—Typical oven set-up for finish coats on bodies.

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Smith
1,380,429
June 7, 1921

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Method that is Body Finishing

Wooden Frame and All Steel Construction Succeed Equally in Two Year Production Tests

CONSIDER the general situation:

The streets are full of *faded* cars—new, vigorous chassis carrying bodies that are weather-beaten and lustreless as early as their second or third month.

This is the penalty, owners, dealers and makers are paying for rush work—for the speeded-up production of 1922 and 1923.

The fault lies in the slow finishing systems with their numerous coats and constant visits to the rubbing deck—*systems that it is impossible to hasten without impairing results.*

In 1923, the buying rush is greater than ever. *Prompt delivery is king.*

Is there no solution?

Shall the whole public continue to pay forced tribute to systems which are now outworn and archaic—not in line with modern progress; and which have failed so repeatedly and conspicuously?

This vital problem which has engaged the best brains in auto-body finishing for twenty years has been solved.

Through five years of careful experimenting we have developed a way to short-cut time, reduce cost and insure a hard, high black finish as lasting as the car.

After two years of actual big volume production by the Oxvar method we are justified in signing the radical statements which head this advertising.

Metal bodies with wood frames [or all-steel] are completely Oxvar finished at 400° with a "steel hard" brilliant lustre—after only three to five coats, only one pumice rub—in only 4½ to 7½ hours.

Wood frames gain resiliency and strength—develop no squeak.

Rejects are rare.

Bodies used for over two years show no signs of dimming, checking or lifting.

Re-sales of used cars are facilitated.

Finishing keeps pace with production always. Complete data and plans will be placed before factory executives by our staff of service engineers.

Descriptive booklet covering the principal features and typical cost analysis will gladly be mailed on request to any known member of the automotive industry.

OXVAR

OXFORD VARNISH CORPORATION

Main Office:
EMPIRE BUILDING, DETROIT

Plant:
TOLEDO, OHIO

UNITED STATES PATENT OFFICE.

SYDNEY SMITH, OF DETROIT, MICHIGAN, ASSIGNOR TO THE STUDEBAKER CORPORATION, A CORPORATION OF NEW JERSEY.

METHOD OF TREATING WOOD.

1,380,429. Specification of Letters Patent. Patented June 7, 1921.

No Drawing. Application filed August 2, 1919. Serial No. 315,035.

To all whom it may concern:

Be it known that I, SYDNEY SMITH, a citizen of the United States of America, and resident of Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Methods of Treating Wood, of which the following is a specification.

This invention relates to a method or process for the treatment of wood whereby it is conditioned to withstand high temperatures in excess of its normal critical point and whereby its strength is increased.

When different kinds of woods are subjected to a rise in temperature it is found that each particular kind will withstand a certain degree of temperature rise without showing any deleterious effect, whereas, a continued rise in temperature above this point will result in the destroying of the wood fibers, charring of the wood and depreciation in the strength thereof. The temperature at which the wood succumbs to the heat varies with different woods, and the point at which any particular kind of wood begins to be seriously affected by heat is known as the critical point. In practice, it is found that for the well known woods this temperature will vary from between 125 degrees F. to 160 degrees F.

It is desirable at times in the various arts to so condition wood that it will be able to withstand high temperatures in excess of the normal critical points of the particular kind of wood employed. For the purposes of this disclosure, it is not necessary here to specify the particular arts or the uses to which the wood is employed, but it is sufficient to note that frequently it is desirable to provide means whereby the critical point of a particular kind of wood may be so raised that it may be subjected to otherwise excessive heat without deleterious effects upon the wood. It is also an advantage to increase the strength of the wood for certain uses.

With the purpose of accomplishing these results, I have treated several species of wood by the process hereafter described, and I have discovered that said critical point is raised by such treatment and the strength of the wood is increased.

My method or process consists in treating wood with a solution by immersion or by coating, and then subjecting the wood thus treated to heat, the heat being applied with a slow but regular rise in temperature from zero to approximately two hundred degrees F., extending over a period of approximately four hours. The solution that I have employed for treating wood is what is known in the market as Standard grip enamel. I have found that satisfactory results are accomplished with this substance, but there are other substances of a kindred nature, that is enameling fluids, having the same general chemical constituents, which no doubt would serve the same purpose.

My experiments have demonstrated that wood, the normal critical point of which is around 150 degrees F., can, after being treated as described, be safely subjected to a temperature upward of 300 degrees F. without any detrimental effects. In fact, the treatment serves to not only protect the wood against temperature rise, but also serves to impart greater strength to the wood than was present therein prior to the treatment.

For the purpose of illustration, the result of one experiment will suffice. A piece of maple without any treatment whatsoever was subjected to a heat test and its critical point was found to be around 160 degrees. The second piece of maple, cut adjacent the first piece, and of the same size, was treated in accordance with the method of this invention, the slow baking operation extending over a period of four hours and the maximum temperature reached being 200 degrees F. This latter piece of maple, treated as described, was later subjected to upward of 275 degrees F. without showing any deleterious effect. In this experiment the treated wood withstood an increased rise of 115 degrees above its normal critical point as a result of said treatment. A strength test was also made on both of these pieces of maple, and it was found that the untreated piece broke at 940 pounds. When the treated wood was subjected to a breaking strain it was found to break at 1530 pounds. It thus appears that in the experiment referred to, the wood which had undergone the treatment of this process withstood a test of nearly 600 pounds greater than the untreated stock, or, in round numbers, its strength had been enhanced through the treatment approximately two-thirds. Thus the method or process operates not only to raise the critical point of wood but to greatly increase the strength thereof.

In the foregoing description, I have specifically set forth and described the preferred manner of practising the invention, but it will be understood that I do not limit the method to the specific materials or temperatures specified. The substitution of equivalents and the varying of the temperatures in accordance with the particular woods under consideration are within the scope of this invention.

What I claim is:

1. In the art of treating wood, the process of increasing its strength and raising its critical point, which consists in applying to the wood a chemical agent and thereafter subjecting it to a gradual rise in temperature extending over a prolonged period.

2. In the art of treating wood, the process of increasing its strength and raising its critical point, which consists in applying to the wood a chemical agent and then subjecting it to a gradual rise in temperature extending over a prolonged period, during which a temperature at least equal to the critical point of the wood treated is attained.

3. In the art of treating wood, the process of increasing its strength and raising its critical point, which consists in applying a chemical agent to the wood and thereafter subjecting it to a gradual rise in temperature over a period of upward of three hours, during which a temperature upward of the temperature of the critical point of the wood treated is attained.

4. In the art of treating wood, the process of increasing its strength and raising its critical point, which consists in applying a chemical agent to the wood, and thereafter subjecting it to a gradual rise in temperature for a period of approximately four hours during which a temperature of approximately 200° F. is attained.

5. In the art of treating wood, the process of increasing its strength and raising its critical point, which consists in applying thereto an enameling fluid and thereafter subjecting it to a gradual rise in temperature.

Signed by me at Detroit, Michigan, U. S. A. this 29th day of July, 1919.

SYDNEY SMITH.

Witnesses:

VINCENT LINK,

A. E. LEACH.